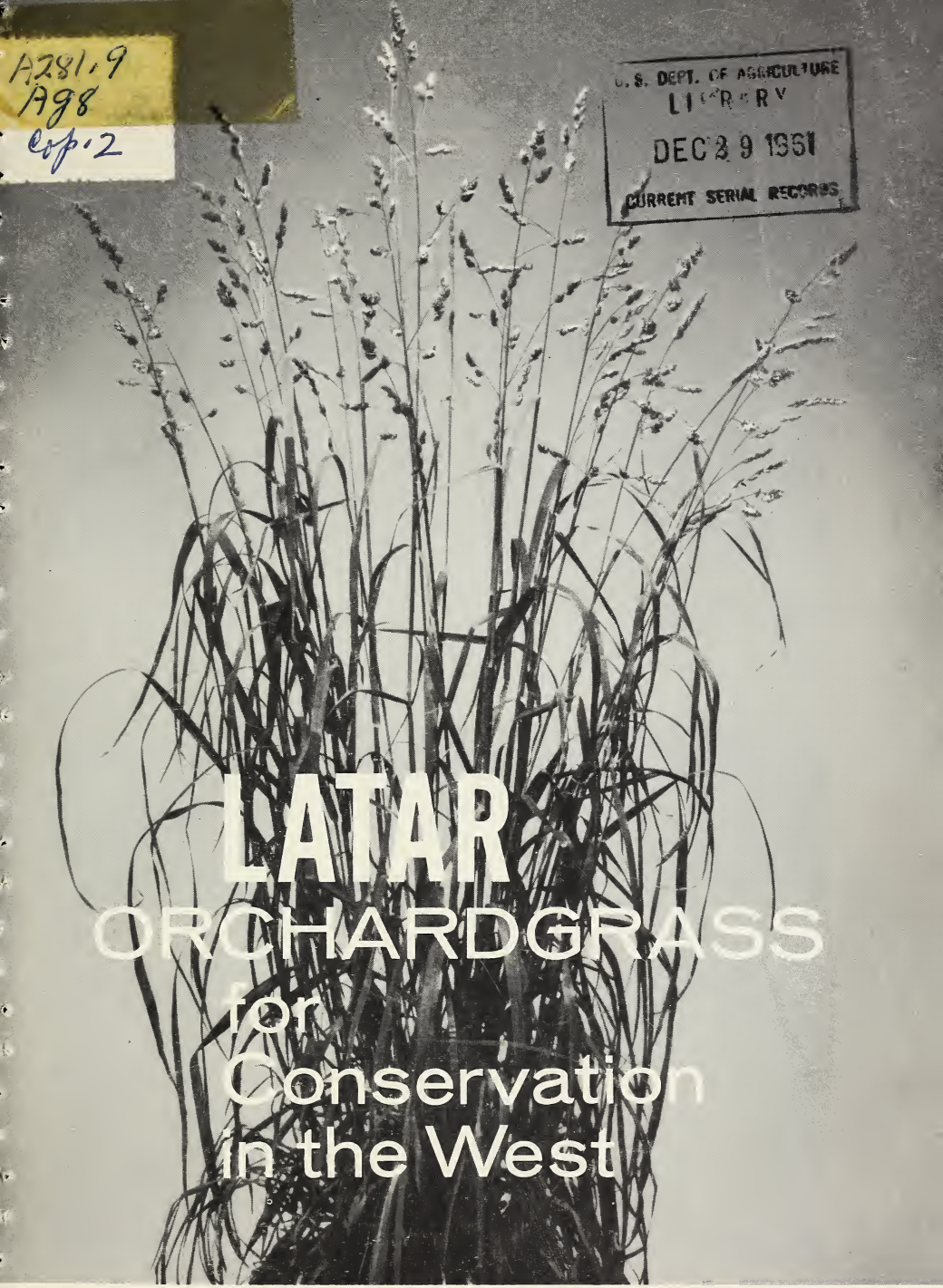

LATAR ORCHARDGRASS for Conservation in the West

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LATAR ORCHARDGRASS
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United States Department of Agriculture, Soil Conservation Service, in cooperation with Idaho, Oregon, and Washington Agricultural Experiment Stations

Latar orchardgrass was developed for its high quality as feed when used with legumes for hay, pasture, and silage.

The outstanding features of Latar are late heading, leafiness, and low lignin (fiber) content. These features make it especially well suited for use with alfalfa. Many other orchardgrasses head early and become coarse by the time alfalfa is ready to cut. Latar is usually not beyond the early heading stage when alfalfa reaches the proper stage for making hay. The Latar-alfalfa mixture gives high yields and contains enough grass for soil and water conservation.

Under irrigation the Latar-alfalfa mixture also produces high yields.

Many alfalfa-grass and Ladino clover-grass mixtures using Latar orchardgrass are grown on farms in soil conservation districts in the West. Cooperators report that their livestock prefer this mixture to hay mixtures using common orchardgrass. They also note that the Latar recovers more rapidly after cutting than other orchardgrasses. The same thing is true of Latar in Ladino clover-orchardgrass mixtures when pastured.

Research studies at the Washington Agricultural Experiment Stations verify these results (tables 1–3). At Pull-

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Two types of orchardgrass: Common (left) is stemmy and 10 days past the bloom stage; Latar (right) is leafy and in early bloom.

IDA–45271

Two alfalfa-orchardgrass seedings in a field planting. Latar on the left has not headed out, while common orchardgrass on the right is mature. The alfalfa is ready to cut.

man, Latar and other orchardgrasses were compared at five stages of growth. Latar was higher in percentage of leaves and generally lower in percentage of stems and heads than other orchardgrasses at the boot and later stages of growth. Latar with 10 percent more leaves than Commercial was the leafiest of the strains tested.

Laboratory studies showed that Latar was lower in lignin content than Commercial at all maturity stages.[1] The greatest difference in total plant lignin content—1.7 percent—occurred at the flowering stage. The lignin content of leaves only, removed from the plant at various maturity stages, was also determined. At all stages Latar leaves were lower in lignin content than leaves of the other orchardgrasses.

The study of lignin content was followed with digestibility trials using sheep. Latar, S–143, and four other orchardgrasses were harvested at the flowering stage, field cured, and fed to Hampshire wethers. There was an

[1] Sosulski, F. W., J. K. Patterson, and A. G. Law. 1960. The lignin content of grass strains. Agr. J. 52(3): 130–134.

TABLE 1.—*Hay yield of three alfalfa-orchardgrass mixtures at Pullman, Wash. (3-year average—1954–56)*

Mixture of alfalfa with:	Time of heading	Hay yield per acre	Percentage of grass
		Tons	*Percent*
Potomac orchardgrass.	Early....	2.82	34
Akaroa orchardgrass.	Medium.	2.74	30
Latar orchardgrass.	Late.....	3.15	19

TABLE 2.—*Oven dry forage yield of three alfalfa-orchardgrass mixtures grown under irrigation at the Irrigation Experiment Station, Prosser, Wash. (4-year average—1954–57)*

Mixture of alfalfa with:	Forage yield per acre	Percentage of grass
	Tons	*Percent*
Potomac orchardgrass.....	4.4	34
Akaroa orchardgrass.....	4.9	24
Latar orchardgrass.....	5.3	24

TABLE 3.—*Lignin content of three orchardgrasses at five stages of growth at Pullman, Wash.*

Orchardgrass	Stage of growth				
	Early	Boot	Pre-head	Head	Flower
	Per-cent	*Per-cent*	*Per-cent*	*Percent*	*Percent*
Latar.....	3.5	3.6	4.2	5.3	6.2
S–143.....	4.1	3.8	4.2	6.3	7.2
Commercial .	3.8	3.8	4.3	5.5	7.9

average increase in digestibility of 6 percent for each 1 percent decrease in lignin content. Latar was 7 percent higher in digestibility than S–143, which is medium late.

These results mean that pound for pound and ton for ton Latar has 7 percent more digestible nutrients than S–143. Based on these average figures, Latar would be 10 percent more digestible than early Commercial.

Preliminary examination of good stands of Latar and alfalfa indicate that Latar is equal to other orchardgrasses in root production. Orchardgrass-alfalfa mixtures are high in root production. Alfalfa alone produced 3,340 pounds of roots per acre and alfalfa-orchardgrass mixtures produced 7,780 pounds on Palouse silt loam at Pullman, Wash.[2] This is especially important in conservation seedings. The high yield of fibrous roots improves soil tilth and increases the rate of water penetration and the amount of organic matter in the soil.

Latar orchardgrass is as winter hardy and resistant to grass diseases as other orchardgrasses.

Use in Conservation Seedings

Latar is replacing other orchardgrasses in conservation seedings where perennial legume-grass mixtures are

[2] Woods, J. E., A. L. Hafenrichter, J. L. Schwendiman, and A. G. Law. 1953. The effect of grasses on yield of forage and production of roots by alfalfa-grass mixtures with special reference to soil conservation. Agr. J. 45: 590–595.

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Roots of Latar are abundant and fibrous.

used in soil-improving crop rotations or for hay, pasture, or silage. It requires deep, fertile, moderately permeable silt loams or well-drained clay loams with a pH range of about 6.0 to 7.5. It grows well on sandy loams when irrigated. It needs at least 20 inches of precipitation in subhumid areas and season-long water when grown under irrigation. It should not be used in short rotations with annual or biennial legumes, in orchard cover crops, or in waterway seedings.

The map showing the areas of adaptation of Latar is based on tests at experiment stations and on field plantings on farms in soil conservation districts. These trials began in 1948, and more than 100 field plantings have been made in the West. Farmers have established many fields since 1958 when certified seed was first available on the commercial market.

Zones of adaptation of Latar orchardgrass in Western United States.

How Developed

Latar was developed from a foreign plant introduction: P.I. 111,536. It was received in 1935 and compared with more than 100 other accessions at the Pullman, Wash., Plant Materials Center for leafiness, yield, hardiness, disease resistance, and dates of flowering and maturity. The original material was improved by recurrent selection to obtain strong seedling vigor, uniformity in leafiness, and late flowering.[3] It was tested with other leading orchardgrasses at several locations in the Pacific Northwest, both when grown alone and in mixtures with legumes. Latar was named and released in 1957 and registered with the American Society of Agronomy in 1958.

How and When To Seed

Latar has the same requirements for establishing seedings as do other orchardgrasses. Good seedbeds, proper time and rate of seeding, and proper fertilizing are the keys to successful production of Latar. So is the application of water when Latar is grown under irrigation. Latar is seeded with a legume except when it is grown for seed.

Good seedbeds are free from clods, cultivated to reduce annual weeds, and well packed to make them firm. Where lime and fertilizer are used, they are worked into the surface soil before the final harrowing and packing. Fertilizer may also be applied by placing it in the drill row under the seed at planting time.

The kind and amount of lime and fertilizer used before or at seeding time vary with climate and soil. Lime may be needed for legume-grass seedings in the areas west of the Cascade Mountains. For maximum production phosphate and potash may also be needed. A soil test will show the amount needed on different soils. Lime is seldom required in subhumid or irrigated areas east of the Cascade Mountains or in the Great Basin. Applications of 20 pounds of nitrogen per acre as ammonium sulfate or borated ammonium sulfate help in subhumid areas. Under irrigation an application of 100 to 200 pounds of am-

[3] A. G. Law, agronomist, Washington Agricultural Experiment Stations, assisted in making these selections.

monium phosphate-sulfate (16–20–0) per acre has been beneficial before seeding on land from which a grain crop was removed.

Grass-legume mixtures are seeded in the spring in subhumid areas as soon as a good seedbed can be prepared. In irrigated areas they are made in late summer just after grain is harvested. The most successful seedings are made without a companion or "nurse" crop.

Seedings should be made with grain drills, preferably those with small seed attachments. Depth regulators on the furrow openers insure a proper seeding depth, 1 inch or less. They may not be required on well-firmed seedbeds, but the depth should be checked. A combination packer and drill may be used when irrigation is by sprinkler.

The land is preirrigated when seedings are made in late summer on irrigated land. Following seeding, keep the surface soil moist by frequent irrigations.

Alternate-row seeding insures a good stand of both the legume and the grass because it reduces seedling competition. Alternate-row seeding is easily done with drills equipped with small seed attachments. Place the legume seed in the small seed attachment and the grass in the grain box. Close or plug alternate openings in the two boxes. You can use grain drills with only one box by placing cardboard or plywood dividers between the seed openings and using rice hulls to dilute the seed. Mix 7 pounds of rice hulls with the grass seed and 9 pounds of hulls with the inoculated legume seed for each acre to be seeded. Fill the partitioned grain drill—one compartment with legume seed and rice hulls, the next with grass seed and rice hulls, and so on. A drill setting for 160 pounds of barley per acre will seed this alternate-row planting with accuracy.[4]

Rates of Seeding

The rates of seeding depend on the intended use of the crop, the condition under which it is grown, and the method of seeding. When the major use is for hay or silage the grass should be about 30 percent of the crop. The grass should be about 50 percent of the forage when the intended use is pasture. The following rates of seeding have been most successful in field plantings for many years.

[4] MacLauchlan, R. S. and A. L. Hafenrichter. 1961. Alternate-row grass-legume seedings. J. Soil and Water Conserv. 16(2): 61–64.

ORE–75222

A grain drill modified to seed a grass and a legume in alternate rows. Plywood dividers separate the seed openings. They are held in place with masking tape.

Crop used for hay or silage

Subhumid conditions—rates per acre
Solid seedings (legume and grass in the same drill row)
Latar 5 pounds—alfalfa 5 pounds
or
Latar 5 pounds—birdsfoot trefoil 4 pounds
Alternate rows (legume and grass in separate drill rows)
Latar 3 pounds—alfalfa 3 pounds
or
Latar 3 pounds—birdsfoot trefoil 3 pounds

Irrigated conditions—rates per acre
Solid seedings
Latar 8 pounds—alfalfa 6 pounds
or
Latar 8 pounds—birdsfoot trefoil 4 pounds
Alternate rows
Latar 5 pounds—alfalfa 3 pounds

Crop used for pasture

Subhumid conditions—rates per acre
Latar 5 pounds—alfalfa 3 pounds

Irrigated conditions—rates per acre
Latar 8 pounds—alfalfa 3 pounds
or
Latar 8 pounds—Ladino clover 2 pounds

Seed Production

Latar produces good seed crops for a late-maturing grass. It produced 700 pounds of clean seed per acre under optimum conditions at Pullman, Wash. The same field produced an average of 250 pounds of seed per acre for 7 consecutive years. Latar has produced 10 to 15 percent less seed than the early orchardgrasses.

Seed is best produced on deep, fertile, well-drained soils in an area receiving at least 20 inches of precipitation annually or under irrigation.

Fields that are selected for production of certified seed must not have been used for grass-seed production during the previous year. And the field must not have grown any orchardgrass for seed during the preceding 2 years. Fields are plowed in the fall, and a clean, firm seedbed is prepared in early spring. Seed is planted in 36-inch rows at the rate of 2 pounds per acre, and 20 pounds of nitrogen per acre is applied at time of seeding.

Seed fields are kept free from weeds by cultivation and the use of selective herbicides. Orchardgrass seedlings are sensitive to weed killers, so care must be taken when using them. When the Latar seedlings are about 4 weeks old, the field can be safely sprayed with a di-nitro weed killer. When the seedlings are about 2 months old, light applications of one-half pound of nonvolatile 2,4–D per acre may be used. The field can be sprayed again when the plants are well established, and as much as three-fourths of a pound of 2,4–D may be used. The plants must not be sprayed after they begin to head.

Cultivation can begin as soon as the rows are visible. Sugar beet or bean disks and sweeps give good results. Cultivation should be shallow and only frequent enough to kill weeds. One deep cultivation can be made each year after seed harvest.

Nitrogen is the principal fertilizer used for seed production. It is applied at the rate of 60 pounds per acre in the fall of each year when the crop is grown under subhumid conditions. A side dressing gives the best results. Nitrogen is applied at the rate of 80 pounds per acre in the fall or early spring when the crop is grown under irrigation. If more than three seed crops are taken from a field the amount of nitrogen should be increased about 33 percent.

Latar shatters, as do other orchardgrasses, when the seed crop matures. Therefore, the highest yields are obtained when the crop is cut with a binder, shocked, and threshed after it has cured. The crop is cut and bound when the stems are nearly all yellow or when most of the seeds are in the hard-dough stage. It may be combined, but shattering may occur or the seed may heat in sacks or in bins.

No special storage conditions are required for threshed Latar seed, except that it should be kept cool and dry. For safe storage, the moisture content should be below 14 percent. Good seed should have a purity of 90 and a germination of 85 percent.

Certified or registered Latar seed should be grown to maintain the special quality features of Latar. Foundation seed is available from the

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Alternate-row seeding of orchardgrass and birdsfoot trefoil.

crop improvement association or from soil conservation districts in the States where Latar has been released.

Management of Established Stands

Mixtures of alfalfa and Latar orchardgrass used for hay or silage are managed the same as are mixtures of alfalfa and other grasses. The time of cutting is determined by the alfalfa, even though the Latar is in the early heading stage. The same rule holds for mixtures of trefoil with Latar.

Pasture mixtures containing Latar require more attention to management than mixtures containing other varieties of orchardgrass. Good grazing-management practices must be used or the livestock will overgraze this mixture. Then the advantages of the superior quality of Latar will be lost.

Pasture mixtures using Latar should not be grazed in early spring until the grass is 8 inches tall. They should not be grazed closer than 3 inches. Ladino clover-Latar mixtures require a 21-day regrowth period for best results. Alfalfa-Latar mixtures require at least a 30-day regrowth period. The last grazing in the fall should leave 4 inches of stubble.

Pasture mixtures containing Latar are fertilized the same as are other orchardgrass mixtures. Amounts of fertilizer vary with location. Average amounts per acre for best yields under irrigation are: 50 to 70 pounds of phosphate and 10 tons of manure or 100 to 150 pounds of nitrogen fertilizer. The nitrogen fertilizer is applied in split applications. The amount per application depends on the length of the growing season, but an application each time the livestock have grazed a field has given best results.

Pastures should be clipped and harrowed at least twice each season to remove any rank growth that remains and to scatter droppings.

Irrigation frequency and amount will depend on soil type and condition and the legume used in the mixture. For example, a Latar-Ladino clover pasture on sandy loams requires water every 7 to 10 days; on clay loams this mixture requires water every 10 to 14 days.

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